ADVANCED MATERIALS

Supporting Information

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Electrically Tunable Selective Reflection of Light from Ultraviolet to Visible and Infrared by Heliconical Cholesterics

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Supplementary Information

Electrically tunable reflection of light by heliconical cholesterics in broad temperature and spectral ranges

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We determined the characteristic times of electrooptic response by recoding the transmittance change of the circularly polarized light through the cell, for three different regimes of switching.

1. Homeotropic-to-heliconical switching. In the homeotropic state, the cell transmits most of the circularly polarized light. In the heliconical state, most of light is reflected. The switching time from the homeotropic state (applied electric field $E = 5\ \mathrm{V}/\mu\mathrm{m}$) to the oblique helicoidal state with reflective red colour ($E = 1.1\ \mathrm{V}/\mu\mathrm{m}$), is about 0.8 s, Figure S1. The time is defined as the time needed to change the transmitted light intensity from 90% to 10% of its maximum value, Figure S1.

2. Scattering fingerprint state-to-heliconical switching. With the same set up, we determined the time of this switching (to the red colour-reflecting state) to be about 2 min.

3. Scattering fingerprint state-to-homeotropic switching. With the same set up, we determined the time of this switching to be about 60 ms; the time is short as the applied electric field is strong enough to speed up the structural reconstruction.

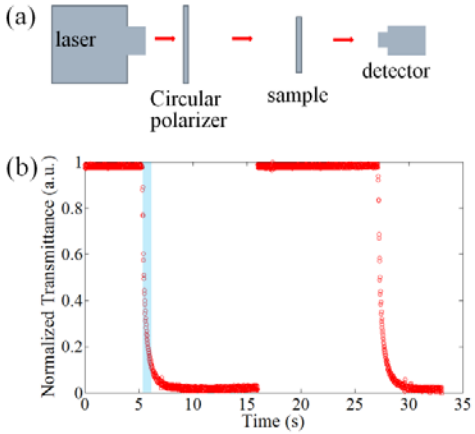

Figure S1. Electro-optic response of cholesteric structures. *(a) Schematic illustration of the experiment setup. (b) Dynamic process when the sample switched between hometropic state and heliconical state with red reflection colour (λ_p=632nm). The transmittance is 1 for homeotropic state, and 0 for heliconical state with red reflection colour (λ_p=632nm).*

In addition, Supplement video 1 shows the real time dynamics of electric field tuning of selectively reflected colors, while Supplement video 2 shows the dynamics of the corresponding spectra.